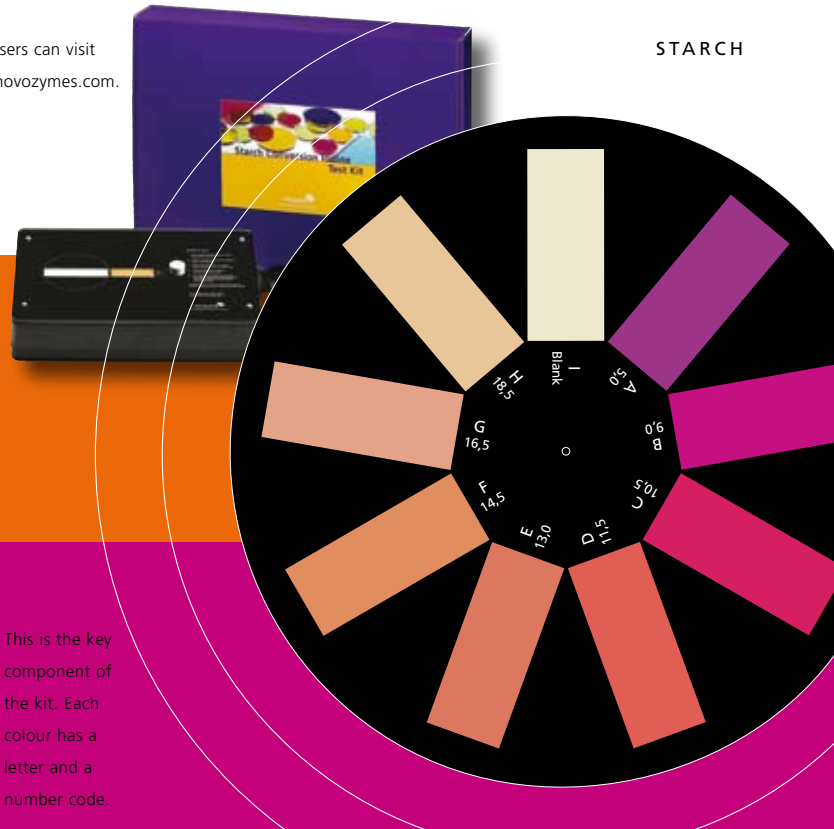


Novozymes has developed a standardised method for testing the content of starch after liquefaction. It is an easy-to-use iodine test kit that helps customers to keep liquefaction under control.

This is the key component of the kit. Each colour has a letter and a number code.



The eye cannot lie with the wheel of colour

In starch processing plants, iodine solution is used to measure the breakdown of starch, but the current iodine tests are not very precise. Iodine is mixed with a sample of the starch slurry after the second liquefaction. If a blue or purple colour is obtained, then the starch degradation is incomplete. A reddish or orange colour is a good result, indicating that only a little starch is left. A beige colour is even better and indicates no reaction with starch.

The iodine test is always done manually and it is up to the operator to decide what to call the colour when writing a test report. "Light blue" to one operator could be described as "purple" by another. A light-reddish colour could be called pink or red, depending on individual perception. Colours can look different depending on whether they are viewed in a darkened room or broad daylight. And to complicate matters even further, some operators use

five drops of iodine solution while others use ten.

All this makes it very difficult to compare results from one plant to another or even within the same plant.

Customer request

One of Novozymes' customers pointed out this problem during a conversation with Lars Peter Andersen, a technical service manager for the starch industry. He set his mind to finding a solution. Technical service is not just about optimising the use of enzymes; it can also involve troubleshooting and problem-solving.

Lars Peter Andersen came up with a kit that is very easy to use. The kit contains a light box with a specially developed colour wheel. The wheel is rotated until the colour matches the colour of the sample placed in the Petri dish above the light box. When testing, it doesn't matter whether the kit is located in a dark or light place.

A standard method of preparing the sample is given in the instructions to the kit.

Colourful research

To obtain the right colours for the kit, a liquefaction trial was carried out at Novozymes' pilot plant. The initial percentage dry substance of the starch in the liquefaction was 35%. Samples were taken every 15 to 30 minutes during liquefaction,

and the dextrose equivalent (DE) and iodine colour of each sample were determined. Professional photographers took digital pictures of the iodine colours obtained from each sample. From this, a first prototype colour wheel was produced.

An identical liquefaction trial was then carried out in the pilot plant. The digital colours obtained were calibrated against the new samples. From this, a revised colour wheel was produced.

The second prototype colour wheel was then tested against samples from two full-scale liquefactions at wheat starch and corn starch plants. The colour matches in these trials were so good that no further adjustment of the colour wheel was necessary.

Each colour is marked with a letter code and a DE number, making it very easy to compare results. After the first phase of distribution of the kits to starch customers, the feedback has been very favourable. The kit is highly appreciated and is being used on a daily basis by several operators at each plant. It is a simple tool for supporting plant operations and shows how technical service can be of assistance in many ways. ●



Lars Peter Andersen of Novozymes, the inventor of the new test kit.

FOR MORE INFORMATION
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